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ABSTRACT

A study was conducted as part of a program to develop and test an individual level communications model. The model proposes that audience members bring to communications situations a set of learned cognitive processing strategies that produce cognitive structural representations of information in memory to facilitate the meeting of the various goals or needs that motivate media exposure. Among these strategies are imagery usage, total or partial avoidance, cross-contextual recoding, making inferences, active repetition, and memorizing. The model also proposes that an individual's exposure goals in a given situation may delineate task constraints on the cognitive processing system. In the study, 115 college students indicated that suggestion and environmental reinforcement were not strong enough to induce reliably the uses and gratifications orientations of surveillance, diversion, and anticipated communication in a laboratory setting. Self-reported use of imagery related positively to cognitive differentiation and negatively to subjects' thinking about other matters while reading, supporting a central assumption in the model that imagery strategy is resource and detail intensive. (FL)

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THEORY AND METHODOLOGY
DIVISION

REFINING USES AND GRATIFICATIONS WITH A HUMAN INFORMATION PROCESSING MODEL

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After its birth as a classification of need-based audience experiences in an era of reaction to the hypodermic model of communications effects, the Uses and Gratifications approach has been the subject of some multivariate analysis and theoretical speculation. But there have been relatively few attempts to test formal hypotheses (see Becker, 1977) and validate the assumptions of Uses and Gratifications in the context of process models specifying individual-level or structural antecedents of media exposure patterns or the outcomes of using media fare for various purposes, despite calls for this kind of research (e.g., Blumler, 1977; McLeod and Becker, 1974; McGuire, 1974; Elliott, 1974). In addition, Uses and Gratifications research is predominantly based on cross-sectional surveys, with little cross-methodological validation attempted (or reported) through means such as formal laboratory experimentation.

The challenges of experimentation in Uses and Gratifications, which by the nature of the model involves the induction of a perceived need or goal, have been noted (Becker, 1977). Successful experimentation, of course, requires development of theory, since a controlled experiment usually assumes that a particular phenomenon can be understood as a process, and some critical component manipulated by the experimenter. Given at least some desire on the part of scholars to perform experiments, and the relative salience of the Uses and Gratifications approach among individual-level communications models, a dearth of reported experiments based on this model may largely be due to a lack of understanding of process, or lack of manipulatable variables.

This study represents a preliminary stage of experimentation in a program designed to further develop and test a model combining the Uses and Gratifications approach with a resource-allocation "stage" model of human information processing and memory. This process model, based on Atkinson and Shiffrin (1968) and related research, provides the basis to suggest that use of mass media by individuals to meet different needs can have specific and differential effects on cognitive structure

and on information utility upon later recall. By specifying stages and processes involved in the acquisition, storage, and retrieval of information, the model can be useful in the development of cognitive approaches to understanding communication now coming to the fore in research. In addition, it has practical implications in the development of our understanding of the compatibility of message structural characteristics and channel characteristics with cognitive processes under various circumstances, such as decision making (Bybee, 1980) or other message-use orientatio

THEORETICAL BACKGROUND

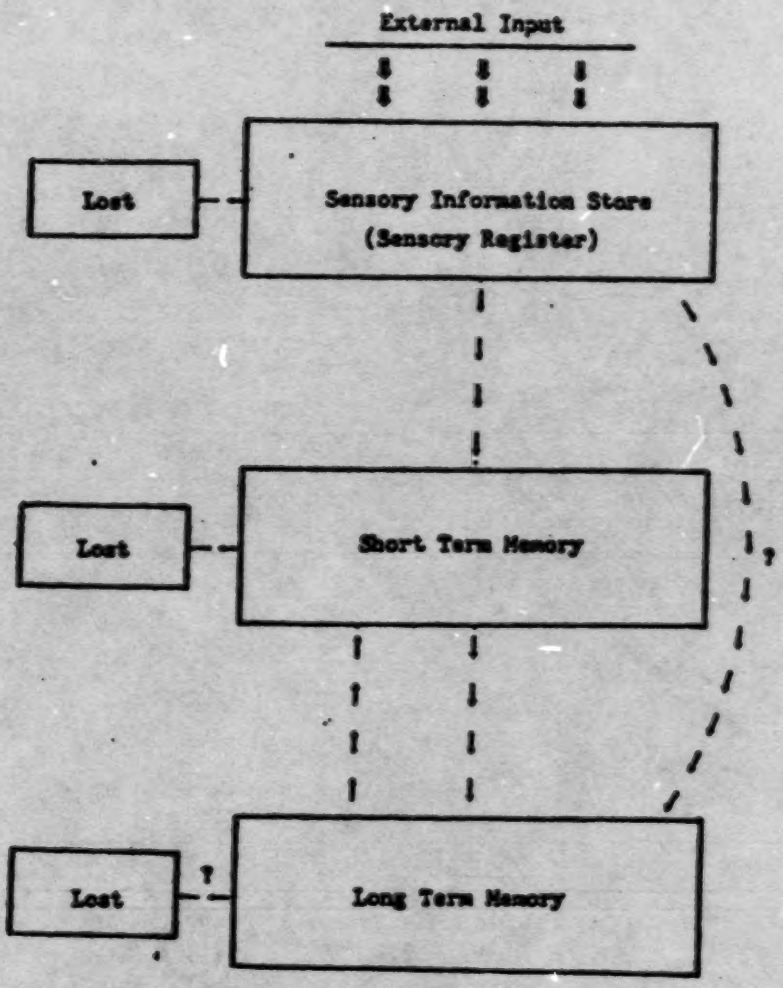
Information Processing and Storage

The imperfection of human memory has led to attempts to describe human information processing in terms of "stage Models" (Kohler, 1947; Melton, 1963). This stage analysis separates learning and memory into three basic processes: acquisition, retention, and retrieval of information from memory when needed (Crowder, 1976), all of which are constrained by limited resources allocated to the tasks (Barclay, 1973; Massaro, 1975; Rumelhart, 1977; Tulving and Thomson, 1973). Information is considered not to be structured statically, but reorganized during cognitive processing (Anderson and Ortony, 1975).

This approach also tends to identify distinct structural and control features of the human cognitive system. The most distinct of these models is that proposed by Atkinson and Shiffrin (1968). The model, a basic version of which is illustrated in Fig. 1, consists of the primary structural components of three memory stores (sensory register or sensory information store, short term memory, and long term memory), rules governing loss of information (forgetting) by interference or decay, and the transfer channels among them. The process of stimulus recognition is not of concern in this study, so attention will be paid to short term memory (STM) and long term memory (LTM).

Figure 1:

Information Processing Model
Based on Atkinson and Shiffrin (1968)



Model is primarily auditory-visual-linguistic. Uncertain transfer operations are noted by question marks.

Short Term Memory

Short term memory is considered something of a processing workshop with limited resources and capacity (note Miller, 1956) and with access not only to external input but also to information already stored in LTM. The model proposes that information can be maintained in STM for only a matter of seconds unless it is maintained through rehearsal or recoding processes. Rehearsal is maintenance primarily through active repetition such as one experiences when trying to remember a phone number on the way to the phone, after looking it up. Recoding, which includes some rehearsal, involves restructuring the information held in STM ("thinking about it") for purposes such as preparation for storing it in LTM in part by relating it to information already in LTM (Craik and Watkins, 1973; Jacoby and Bartz, 1972; Massaro, 1975; Modigliani and Seamon, 1974). New information entering and processed in STM can interfere with other information in STM, also producing a loss of the previous information. ("Interfering Tasks," such as counting backwards by threes, are used in some experiments to inhibit maintenance of information by rehearsal or recoding, since the subject must allocate so much of STM resources to counting that there are not enough left over for maintenance of stimulus material--see, for example, Glanzer and Cunitz, 1966).

Long Term Memory

Information in long term memory is considered relatively permanent, and the primary control process in LTM is retrieval of stored information, directed by a search process. (This search process, Crowder, 1976, notes, differs for recall and for recognition tests.) Long term memory has been considered to include a semantic (meaning and meaning-based knowledge) memory (Rumelhart, 1977; Tulving, 1972), a lexicon (Massaro, 1975), an episodic (event-related) memory (Tulving and Thomson, 1973), and other perceptually related or sensory-oriented stores for sounds and images (Atkinson and Shiffrin, 1968; Paivio, 1969, 1971).

Cognitive Structure and Information Recall

The organization or structuring of stored information (knowledge) in LTM is considered an important condition for memory (Mandler, 1967), and much information--such as potential inferences or derivable relationships--is contained in the organizational structure itself (Anderson and Bower, 1973; Rumelhart, 1977; Quillian, 1968, 1969). In semantic memory, the structure is considered to be the meaning relationships among concepts constituting semantic memories. This structure is often considered hierarchical, with higher-order or more abstract meanings subsuming more concrete ones (Ausubel, 1962; Crowder, 1976; Mandler, 1967; Bower, Clark, Lesgold, and Winsens, 1969), although there are also the more traditional "associative" approaches to memory (for example, Jenkins and Russell, 1952; Ebbinghaus, 1964) and combinations of the two (for example, Deese, 1959).

Semantic Network

An emergent derivation is the "semantic network" model which is basically hierarchical and considers associations as byproducts of what are really reticulated sets of functional, directed, essentially "meaningful" relationships (links) among "nodes" (concepts) stored in semantic memory (Anderson and Bower, 1973; Rumelhart, Lindsay, and Norman, 1972; Quillian, 1968, 1969; Collins and Quillian, 1969). The model posits that, based on the organizational structure of the network, different information is differentially available, based on the number and configuration of linkages which must be traversed for retrieval of information (see, for example, Collins and Quillian, 1969). Thus, based on variance in recall cues and differences in cognitive linkages, some information that is stored in memory may be harder to retrieve than other information, providing us with the common experience of at times having "known" a piece of information but being unable to recall it unless, for example, another person provides us with the appropriate "link" to the situation at hand.

Retrieval of information from LTM is considered sensitive to the conditions of storage, a factor that can account for some dysfunctions of memory. "Even if input is thoroughly processed and carefully stored," Rumelhart (1977) notes, "it will not be retrievable unless the context of retrieval matches that of storage in certain important ways....Just those aspects [of information] that were noticed and believed relevant at the time of storage...can serve as efficient guides back into memory." Retrieval of stored information for application in a context other than that of a given stimulus message would require some active recoding of the trace (for example, thinking about the stimulus material in terms of the contexts of other information in LTM) either at the time of processing or at a time subsequent to it (see Tulving and Thomson, 1973), a factor which may be influenced by the needs or goals one has in paying attention to messages.

Imagery

Images, according to Paivio (1969), are symbolic processes which can serve as symbolic coding and organizational systems that are redundant or alternative to semantic verbal systems. Images from memory can be constructions actively generated by the individual, or conditioned sensations stimulated by words or perceived objects with which they are associated. In addition, images and their transformations can serve as mediators in verbal learning, Paivio says.[1] In regard to "Verbal Imagery" (i.e., the stimulus in text), experimental evidence indicates that concrete words bring about images more readily than abstract words (Paivio, 1971), and that recall is more efficient when an event is stored in both verbal and imagery systems (Seamon, 1973). These results tend to support Paivio's (1971) "coding redundancy" hypothesis: that memory increases directly with the number of alternativ memory codes available for an item.

Verbal imagery may bear some important relationships with cognitive structure as well. Kintsch (1974) suggests that "high-imagery, concrete words can be

described in the subjective lexicon by a few strong relations, while low-imagery abstract words enter into more relations, and more diffuse ones, with other words," indicating that the semantic network is more diffuse for abstract (low-imagery) words than for concrete (high imagery) words. Compared to low-imagery words, high-imagery words have been found to produce more associations (Kintsch, 1974) and cluster into groups more readily (Paivio, 1971) with other words.

These findings suggest that semantic representations derived from high-imagery concrete words--and perhaps by extension the system of representations derived from descriptive imagery as a device in prose--are highly constrained semantically in memory. The redundancy of the constraint (a tightly-knit interweaving of concrete-level linkages) may lead to superior recall of items of information within the context of information present at the time of storage, but produce entropy of linkages and poor recall externally (with traces or cues from other semantic contexts) unless considerable recoding effort is made to forge semantic links via abstraction or cross-contextual recoding.

Storage Environment

An application of the Human Information Processing perspective to Uses and Gratifications can be made by a brief exploration of the "storage environment" of information processing, the "extrasentence linguistic and nonlinguistic context" that, Anderson and Ortony (1975) note, can play a large role in comprehension, organization, and recallability of information contained in a message. Particularly useful in this regard is the Transactional Model proposed by McLeod and Becker (1974), which suggests that "the exposure characteristics of the message combine with the orientations of the audience member in producing an effect." Thus, the "storage environment" from an information-processing standpoint would consist primarily of relationships among variables of exposure,[2] channel characteristics,[3] message characteristics (structure as well as content),[4] and

the audience member's "orientation" to the message during exposure or input. Since the study to be reported tends to hold constant the variables of exposure and message/channel characteristics, attention will be turned primarily to the "orientation" variable.

Orientation to the Message (Task Constraints)

Two primary assumptions of the Uses and Gratifications model--that audience members are "active" and are "goal-directed" in attending to media fare (Katz, Blumler, and Gurevitch, 1974; McQuail, Blumler, and Brown, 1972)--can be applied further to the various information-processing activities that may occur to meet different needs or goals, and the possible outcomes of those activities on cognitive structure and recall.

In describing the Uses and Gratifications model, Katz, Blumler, and Gurevitch (1974) note that this area of research deals with "(1) the social and psychological origin of (2) needs, which generate (3) expectations of (4) the mass media and other sources, which lead to (5) differential patterns of exposure (or engagement in other activities), resulting in (6) need gratifications and (7) other consequences, perhaps mostly unintended ones." Exposure patterns (including avoidance of certain media or content) can also be influenced by factors such as attitudes toward the media, established media/content dependencies, and assessments of credibility which audience members bring to the communication situation (McLeod and Becker, 1974) as well as other elements of what Singer (1980) calls "a complex set of plans, private images, and anticipations" which are "one of the major ways in which we manage to avoid being completely bombarded by the tremendous range of stimulation available to any new situation."

Out of the various directions of research that could be pursued in Uses and Gratifications, this study will suggest that audience members bring to the communi-

cation situation a set of cognitive processing plans (albeit not necessarily conscious plans) more refined than broad patterns of attention or avoidance. Specifically, one's so called "cognitive skills" may include learned processing strategies that can facilitate the meeting of the goal or need which motivated exposure to a given medium or content.[5] One's exposure goals, in other words, may delineate certain task constraints on the cognitive processing system to meet those goals.

In his study of "cognitive tuning," for example, Zajonc (1960) found greater levels of cognitive differentiation, complexity, organization, and unity among experimental subjects task-oriented toward expecting later to provide (rather than receive) information interpersonally after exposure to a stimulus message (describing the characteristics of a fictitious job applicant), and among those in a different experiment expecting to encounter disagreement (rather than agreement) in discussing the applicant with another person after reading the message.[6] Zajonc suggests that greater structuring and attention to detail are necessary for those providing information to others and for those expecting to defend their viewpoints. Similarly, it may not be just idle curiosity that leads many a student to ask about not just the content but the format of an upcoming exam, since the process of studying for a multiple choice exam presents different cognitive tasks than an essay exam, given the student's anticipation of the later recall environment and the kind of cognitive structure he or she may have to achieve to optimize recall under those circumstances.

Of course, the kinds of processing plans or strategies that audience members employ--including a strategy of avoidance--may also depend in part on the expectation or realities of the characteristics of the media or content they may encounter, in particular the compatibility of those characteristics with one's processing goals. In addition, not all of the needs or goals which motivate exposure involve

anticipation of a specific recall environment, although information processing and cognitive structuring may be influenced by these other orientations as well, in ways that will be discussed later.

Arrays and typologies of audience "uses" of the media range from single-dimension approaches, such as the play theory of Stephenson (1967), through multifunctional categorizations such as those developed by McGuire (1974) with 16 proposed motivational orientations, and Katz, Gurevitch, and Haas (1973), who classified a list of 35 media-related needs gleaned from Uses and Gratifications literature into a scheme with 84 possible combinations, which were later reduced via data analysis into 14 orientations. Among the gratifications found via audience studies are various forms of guidance, reinforcement, stimulation, arousal, or excitement, personal identity, companionship, passing time, habit, and other orientations. But among the most common orientations are some form of social utility or Anticipated (interpersonal) Communication (e.g., McLeod and Becker 1974; Atkin, 1972; Becker, 1976; Kline, Miller, and Morrison, 1974; Berelson, 1949) and, in particular, a distinction between "Surveillance"--use of the media to find out what, in some form, is going on in the world, and "Diversion"--use of the media for relaxation, entertainment, and perhaps forgetting the world's and one's own problems (e.g., McQuail, Blumler, and Brown, 1972; McLeod and Becker, 1974; Lometti Reeves, and Bybee, 1977; Becker, 1976; Blumler, 1977; Peled and Katz, 1974). These three orientations will be focused on in this study, Diversion and Surveillance representing individually-based motivations, and Anticipated Communication a socially-based motivation. This distinction may be important, since Chaffee and McLeod (1973b) have noted that "social predictors, such as those based in ongoing communication with others, account for larger differences in information seeking than do individual-level variables."

Orientation and Recall

Relatively few studies in the Uses and Gratifications tradition have treated recall of information from the media as a dependent variable. Blumler (1977) has suggested that "the person who is more strongly and more exclusively moved to consume media materials for their information content is more likely to acquire knowledge from them."

Among studies relating to the three orientations of interest, Gantz (1978) found in a survey that respondents who watch television news primarily for purposes of gaining information (his measures suggest a "Surveillance" orientation) recall more from a newscast than, in descending order, "casual" viewers and those seeking Diversion (even those seeking both diversion and information simultaneously). "Recreation/diversion motivations," Gantz concludes, "interfere with the acquisition of information. Apparently, these motivations set up selectivity mechanisms which limit both intended and incidental knowledge gain." McLeod and Becker (1974) in a survey found a negative relationship between relaxation-orientation and political knowledge, due to avoidance, but no relationship between excitement-seeking and such recall. (This outcome also suggests, from the standpoint of effects validation, a difference between defining "Diversion" as "relaxation" and as "excitement seeking.") Surveillance-orientation showed positive relationships with recall measures, but an Anticipated Communication orientation (defined in their study in terms of an anticipated argument) did not, although these respondents were more selective in their holding of information. Kline, Miller, and Morrison (1974), however, found positive relationships between an Anticipated Communication orientation and two free-recall measures in their survey. One's role in such communication, as Zajonc's (1960) study indicates, may of course account for a lot of variance in recall.

The possibility that selectivity may pay a key role in the processing of information to meet needs or goals, given constraints on the cognitive processing

system, provides the basis for development of a set of theoretical propositions about the relationships among exposure motivations, cognitive processing and structuring, message/channel characteristics, and recall.

A Suggested Information-Processing Approach to Uses and Gratifications

Based on the assumptions of an "active" and "goal-directed" audience, a resource-allocation "constraints" approach to information processing, and the Transactional model, an information-processing model can be suggested which has the following major propositions:

1) The human cognitive system operates to achieve a structural representation of information in memory that is most facilitating to the goal (such as, for example, meeting needs for relaxation or preparation for defending one's viewpoints);

2) The information-processing task is to achieve that cognitive representation, given the message or channel characteristics available for processing;

3) Some combinations of message or channel characteristics are functionally more compatible with the achievement of the information-processing goal than are others;

4) Thus, all else being equal or constant, some kinds of channel or message characteristics may be sought or avoided more than others;

5) The audience member's task-orientation (e.g., the goal-state to be reached) may interact with channel or message characteristics before or during exposure to suggest an information-processing strategy, among alternative strategies (e.g., total or partial avoidance, use of "Imagery," making inferences, cross-contextual recoding, "memorizing," and so forth) to achieve the facilitative cognitive representation;

6) Dysfunctions during recall may occur more readily when the particular retrieval environment had not been anticipated at the time of storage.

In applying these propositions to the orientations of interest in this study, a scenario can be devised that could serve as the basis for a number of studies. This study begins to treat only some of the relationships which could be derived from this model, and tends to concentrate on reading rather than viewing or listening.

It can be proposed that in a Diversion orientation in which one wishes to relax, reduce anxiety, and put aside what is bothering him or her, a person may avoid processing problem-related information (which might increase anxiety) or avoid processing or recoding of other information in a manner that would retrieve from LTM stored information which might serve to stimulate anxiety. This avoidance would include not attending to problem or issue-oriented information in the news, for example. It would also mean that other information processed in a Diversion orientation would not be recoded into problem-related contexts in memory and that, in Diversion, one may also avoid processing information into higher levels of abstraction, since abstract representations, as Kintsch (1974) notes, tend to interact in a more diffuse semantic network. Therefore, the abstraction process may open paths to anxiety-related memory traces which one would rather avoid in this orientation.

Verbal imagery may be highly attractive to individuals in Diversion, and highly congruent with relaxation goals, especially if the imagery stimulus represents matters unrelated to the stimuli that cause them anxiety and are, in particular, reminiscent of pleasurable experiences (such as the description of nature may be to some people). The value of imagery in this case is that processing such description could produce a semantic representation which is highly constrained, and at a concrete level. Therefore, such a message could be "freely" processed without posing much danger of the need to retrieve from LTM (for purposes of recoding and storage operations) any information which could stimulate anxiety and be counter to Diversion goals. In other words, "Imagery Processing" may "fill" STM so that one can effectively keep from thinking about other matters that one would rather not recall at the time, and can produce a constrained representation relatively "unconnected" to anxiety-related stimuli.

In regard to recall, this strategy would produce less recall of problem-oriented information (due to avoidance of that information), although recall of specific details of pleasant, image-related information may be enhanced, since stored imagery may be redundant to semantic organization, providing a "dual trace" (Paivio, 1971) for recall of specifics. However, this potential for superior recall may be context-specific (i.e., limited to the semantic context present at initial processing), since abstraction and cross-contextual recoding may have been avoided, producing a latent dysfunction of limiting the recallability and applicability of this stored information in new contexts which might arise later in interpersonal communication or problem solving.

In a Surveillance orientation, one's task may be more than just "keeping up with events" to include weaving such occurances into the existing cognitive fabric consisting of relationships and their organization. Therefore, individuals paying attention to media fare for Surveillance may also be attempting to organize these events in terms of what they already know, and perhaps orienting their concepts of a world which is beyond most of their personal experience but to which they would have to adjust for purposes of coping and control. Therefore, Surveillance may lead one to seek propositions of a causal or relational nature, or lead one to process information in such a way, allocating cognitive resources to recoding via abstraction or cross-contextual relationships. Persons in a Surveillance orientation may avoid verbal imagery which would be highly incongruent with the task, since processing it involves attending to a flood of concrete detail which may be unnecessary and which may also be eliciting perceptual coding from LTM, effectively competing for the cognitive resources that would otherwise be used for abstraction and drawing relationships with semantically-based knowledge in LTM.

The effects of this strategy on recall would depend greatly on content. The semantic recoding and hierarchical structuring which would likely result from

employing this kind of strategy would usually be expected to lead to relatively good recall (Bower, 1970; Bower and Clark, 1969; Bower, Clark, Lesgold, and Winzenz, 1969; Mandler, 1967), including relatively good recall across semantic contexts. However, recall of details from highly descriptive passages may be reduced due to avoidance.

Preparation for interpersonal communication, especially for roles such as "senders," viewpoint-defenders, and question-answerers, may accelerate the need to derive a cognitive representation which includes considerable detail as well as abstraction and other organizational relationships. Individuals in this orientation may attempt to use strategies such as imagery processing when applicable, although using such a strategy along with semantic processing strategies would either require more time, or be used in lieu of relatively extensive cognitive elaboration when time is constrained, given constraints of STM. The processing strategies to be adopted in this orientation may be highly sensitive to the specific communication role anticipated, as well as the semantic context of that anticipated communication (which would dictate, for example, the extent to which stimulus content would have to be directly recoded for retrieval in another context).

The effects of this orientation on recall would depend on the processing strategies noted, but generally relatively good (albeit perhaps selective) recall might be expected, due either to the semantic processing or imagery processing strategies likely to be employed.[8]

A PRELIMINARY EXPERIMENT

Hypotheses

Using a post-test only control group design (Campbell and Stanley, 1963), a preliminary experiment was conducted in 1979 to test some procedures developed to induce the three Uses and Gratifications orientations in a laboratory and to validate

induction of the orientations by Convergence/Discriminance and by Effects validation on initial measures of other variables derived from the model presented. Following are the major hypotheses (H1 through H4 presented in condensed format, but later analyzed in terms of discrete comparisons).

Provided that the major purpose of the study was to validate the induction and dimensions of Diversion, Surveillance, and Anticipated Communication orientations in an experimental setting, the first hypothesis is:

> H1: The manipulated orientations will correspond to factor scores on an extended set of "Uses and Gratifications" self-report items, with a pattern of convergence and discriminance arising.

To further validate the experimental induction of the Diversion orientation in particular, subjects were given the State-Trait Anxiety Inventory (Spielberger, Gorsuch, and Lushene, 1970), which among standardized anxiety tests was considered useful for this study because it measures separately the level of anxiety at the moment (State Anxiety) as separate from more generalized anxiety in the individual (Trait Anxiety). If Diversion subjects reached a goal of forgetting cares, worries, and problems and achieved relative relaxation after reading, it can be hypothesized that:

> H2: The Diversion Group will exhibit less State Anxiety than the Control Group and each of the other experimental groups.

The next two hypotheses deal with expected cognitive effects of the experimental orientations. Due to the developmental nature of the experiment, Imagery Processing was measured by a single 4-position scale concerning the extent to which subjects tried to "picture" in their minds the description of nature as the author was writing about it.[9] The greatest variance in comparison to the Control Group in particular would be expected among Diversion subjects (facilitation) and among Surveillance subjects (avoidance) such that:

> H3: The Diversion Group will exhibit greater use of Imagery Processing Strategy than the Control Group and the Surveillance Group, with Surveillance less than Control.

Among various approaches to cognitive structure, it was considered most fruitful to concentrate on Differentiation for purposes of this experiment. Zajonc's (1960) measure was used in which subjects are asked to list all the characteristics (attributes) they feel are necessary to describe an object--in this case, the object described in the stimulus passage. Differentiation should be sensitive to processing or avoidance of detail. Regarding the experimental groups, it can be hypothesized:

H4: Anticipated Communication and Diversion Groups will have higher Differentiation scores than either the Control or Surveillance Groups, with Surveillance lower than Control.

The last two hypotheses test expected relationships between cognitive processing variables. Since Imagery strategy should increase memory for details, and in addition substitute spatial organization for semantic organization, it can be hypothesized:

H5: The use of Imagery Processing Strategy will have a positive relationship with Differentiation.

Finally, use of Imagery Processing Strategy should use a large amount of cognitive processing resources in STM on a relatively continuous basis if used to process a descriptive narrative, making it difficult to also attend in part to other matters. A scale asked subjects to rate how frequently there was "anything else" on their minds while reading through the article. It can be hypothesized that:

H6: Use of Imagery Processing Strategy will have a negative relationship with subjects' thinking about other matters while reading the stimulus passage.

Method

Experimental subjects (N=115), students chosen via systematic probability sampling from a university population,[10] were randomly assigned in approximately equal numbers to one of four conditions: Diversion instructions, Surveillance instructions, Anticipated Communication instructions, and Control instructions. Each experimental session consisted of two or three subjects, a strategy chosen to provide implicit social reinforcement for the reading goals suggested to subjects.

Once seated in a semi-circle of chairs, and assured that their co-operation was important, subjects (except for the Control group) were told various reasons for the study. Diversion subjects were told that the process of relaxation was being studied, and that they were to forget any "cares, worries, or problems" and try to become as relaxed as possible for part of the session that was to follow. To aid them, they would be given a piece of writing (a stimulus message). Anticipated Communication subjects were told that the experimenter was conducting a study of interpersonal communication and that each of them would be discussing the (stimulus) article later with one other person waiting in another room who also has some information about the topic.[11] (Their role in the process was left unspecified.) Surveillance subjects were told that a study was being made of the way people keep in touch with what is going on in the world around them. All of the groups were told that others had found the reading material useful for the purpose at hand (Control subjects that it was "useful"), that we often pay attention to the media for these purposes, and that it is important for what follows that they finish and meet their reading goal (for Control subjects, simply that they finish reading).

Subjects in each condition read the same stimulus message, a nature-descriptive narrative containing statements about the relationship of man to extinct species.[12] Reading time and potential post-reading rehearsal time were measured unobtrusively for each subject.[13]

Subjects were given a post-test which included in order (among other measures) an open-ended question about content expectations (what the subject had expected the article to provide), a battery of "Uses and Gratifications" scale items testing reading goals, the State-Trait Anxiety Inventory, some questions concerning reading, attention, and processing (e.g., interest, use of Imagery Processing), the Differentiation measure (put toward the end so that the other measures might serve as interfering tasks for STM), questions concerning the subject's expectations of the experiment, and demographic information.[14]

The Uses and Gratifications battery consisted of two parts, a set of 32 items to be answered according to reading goals when the subject began reading, and an identical set to be answered according to reading goals toward the end of reading. The battery was made comprehensive so as to cover potential aspects of each orientation (including those involving the researcher's expectations of information processing) beyond those suggested to subjects via the experimental instructions. Answering the battery for two points in time was considered useful for discovering any stable patterns of change during reading, including changes in responses which may be due to subjects overcoming any felt need to please the experimenter.

The purpose of the experiment called for giving priority to measures of message use and orientation, and taking the risk that the validity of measures of State Anxiety and cognitive processing self-reports[15] might be compromised for this study due to the effects of answering prior questions on the instrument.

Results

Factor Analysis

All 64 "Uses and Gratifications" items, combining perceptions of reading goals at the beginning of reading--"Time (1)"--and toward the end--"Time (2)"--for subjects, were entered into a factor analysis, using principal-components procedure and Varimax rotation. Results in Appendix A emerged when the program was instructed to accept factors with Eigenvalues of 5.0 or above, and represent Surveillance (Factor I), Anticipated Communication (Factor II), and Diversion (Factor III) orientations.[16]

The Surveillance factor indicates that subjects in this orientation were seeking some help in organizing or understanding events, suggesting that they were attempting to develop a cognitive structure more complex or interwoven than "just the facts." Just "keeping up with events" loads rather low on this factor

(despite, for example, instructions to Surveillance Group subjects). Desire for "details" about the subject matter of the article, in line with the model, has a negative loading on the Surveillance factor, although an item designed to tap interconvextual processing ("A way to relate this matter to other matters") loads more weakly than anticipated (although organization and attendant abstraction could allow for recall from other contexts at future times).

The Anticipated Communication factor appears generally not role-specific although there appears to be some expectation of arguing or defending a point of view (the article perhaps perceived as controversial). A desire for details loads positively on this dimension, albeit more weakly than expected. Cognitive organizational needs are much weaker than expected, although the tendency of such items to be phrased in context of "the world" may limit their application in this orientation.

The Diversion factor tends to show relaxation goals and aversion to anxiety, although there is neither the expected general negation of organizational and problem-related goals nor a strong positive desire for details (in fact, some negative loading).

Efficacy[17]: H1, H2

Table 1 illustrates sets of pairwise comparisons representing discrete hypotheses in this study derived from H1 and based on comparisons of Experimental Groups vertically across means of normalized factor scores. (Individual pairwise hypotheses will not be expressed in text for purposes of brevity.) The pattern of rejections of null hypotheses suggests validation of efficacy of the Anticipated Communication instructions more strongly than that of Surveillance instructions, but leaves the efficacy of the Diversion instructions strongly in doubt.

To aid further analysis of efficacy, the relationship between each subject's experimental instructions and his or her factor score patterns was measured.

Table 1

Correspondence of "Manipulated" Orientations to Measured Orientations

Experimental Group	Normalized Factor Scores: Surveillance[a]	Anticipated Communication[b]	Diversion[c]
Control (Cont.)	-.03	-.00	-.02
Surveillance (Surv.)	.48	-.19	-.01
Anticipated Communication (AC)	-.22	.54	-.25
Diversion (Div.)	-.21	-.38	.26

N=114

a. $F_{3,110}=3.37$, $p<.03$.

Planned Comparisons

Surv. > Cont.? $T_{110}=2.00$, $p<.05$.
Surv. > Div.? $T_{110}=2.76$, $p<.01$.
Surv. > AC? $T_{110}=2.79$, $p<.01$.

b. $F_{3,110}=5.72$, $p<.001$.

Planned Comparisons

AC > Cont.? $T_{110}=2.28$, $p<.03$.
AC > Div.? $T_{110}=3.93$, $p<.0002$.
AC > Surv.? $T_{110}=3.04$, $p<.003$.

c. $F_{3,110}=1.46$, $p<.23$ (ns).

Planned Comparisons

Div. > Cont.? $T_{110}=1.11$, $p<.27$ (ns).
Div. > AC? $T_{110}=2.07$, $p=.04$.
Div. > Surv.? $T_{110}=1.26$, $p<.21$ (ns).

"Success" of the instructions for non-control subjects was considered to occur if the subject's highest factor score was on the factor corresponding to his or her experimental instructions. For control subjects, "success" (for purposes of this analysis) consisted of not adopting primarily any of the measured orientations.[18] Any other patterns were considered evidence of failure of the experimental instructions. Multiple regression analysis (Table 2) indicates that the instructions were more successful among students earlier in their college careers (likely due to relative experimental naivete of freshmen and sophomores), among those who had signed the consent form at a time closer to their participation in the experiment (the interim perhaps producing some unmeasured sensitization or second-guessing); during later experimental sessions (the experimenter probably becoming more practiced or convincing); and among those subjects who felt greater trust in the author (and less concerned perhaps about his motives).

When asked what they had expected the article to provide them, what they definitely expected (more than other things) to get out of reading the article (Table 3), Surveillance subjects in particular tended to say they expected relational forms of information while Anticipated Communication subjects more often expected details and specific facts. Outside of "relaxation," specific content expectations of Diversion subjects are less clearly defined, although the general patterns across groups tend to give some support to the model, given some questions about the strength of the experimental instructions for Diversion in particular.

In regard to the second hypothesis (H2), no differences were found across experimental groups in levels of State Anxiety ($F_{3,111}$=.03, p=.99), and all pairwise planned comparisons were similarly non-significant. Thus, the null hypotheses are not rejected, giving further evidence of non-efficacy of the Diversion instructions in particular. A multiple regression analysis performed

Table 2

Variables Leading to Success of Experimental Instructions

Results of Multiple Regression Analysis (Planned, Hierarchical)

(Missing-data observations deleted from analysis)

Variables listed in order of entry into analysis.

Variable.	Beta	$F_{1,7}$
Year in College.	-1.06	6.22(a)
Sex (Male=0, Female=1).	.34	1.93
Major (Sciences=0, Arts=1).	- .23	.53
Grade Point Average (Cumulative).	.12	.26
Rank in high school (High rank-high score).	- .01	.06
Prior knowledge about passenger pigeon.	- .52	5.57
Trait Anxiety.	- .20	.28
Number of days before experiment that subject signed consent form.	- .87	7.46(a)
Effect of form on concern about experiment.	.00	.02
Worry about experiment.	- .11	.22
Expectation of a test on the reading material.	- .30	1.51
Prior expectation that experiment was about the effects of a message.	- .28	1.99
Prior expectation that experiment included social reading or interaction.	.11	.24
Prior expectation that study concerned evaluation of the message itself.	.00	.01
Date the experiment took place.	.67	6.32(a)
Number of subjects in group.	- .10	.29
Rehearsal Time (after reading message).	- .47	3.13
Interest in subject matter read.	- .01	.05
Prior expectation that experiment was about comprehension.	- .14	.27
Trust in the author.	.80	6.62(a)
Perceived compatibility of message with goal.	- .19	.40
Disagreement with the author.	.26	1.38
Mind already made up about the issue.	.13	.27

Variable.	Beta	$F_{1,6}$
Belief that the author did not have much to say.	- .55	2.23
Belief that message counteracted goal.	.00	.02
Belief that message helped reach "other" goals.	- .79	1.80
Belief that message helped prepare for discussion as goal.	.16	.55
Belief that message helped relaxation as goal.	.03	.01
Belief that message helped relate that material to other world concerns as goal.	.69	.25
Belief that message helped learning as goal.	- .95	1.42
Belief that message helped "triangulation" as goal.	- .88	.68
Belief that message helped purely study-related goals.	-2.77	3.89
Meeting of "other" goals.	1.33	4.56
Meeting study-related goals.	2.37	3.12
Meeting of goal of related material to other world concerns.	-1.10	.73
Meeting of triangulation goals.	.65	.53
Meeting of learning goals.	.28	.18

Constant: 1.15
Multiple-r=.96

a. $p < .05$.

Analysis of Variance	df	SS	MS	F	p<
Regression	38	10.15	.27	2.32	NS
Residual	7	.81	.12		

Table 3

Content Expectations for Experimental Groups

Content Expectation	Experimental Group				
	Control %	Surveillance %	Anticipated Communication %	Diversion %	Total %
Relational Information (process/cause-effect/connection to society)	18	54	34	23	32
Details, Specific Facts	32	27	43	33	34
Persuasion or a Moral	14	12	7	3	9
Relaxation	--	--	--	20	6
Other	36	8	17	19	20
Total	100%	101%	101%	98%	100%
N=	28	26	30	30	114

Column entries are proportions of column totals.
Totals differ from 100% due to rounding.

Chi-Square (with 12 degrees of freedom) = 112.19, $p < .001$.
(Note: Some cell expectations are less than 5.)

Missing observations: 1.

Intercoder reliability of dependent variable: r=.62. Agreement=67%.
(Based on unreduced version of this scheme.)

with State Anxiety as dependent variable, and an array of independent variables entered in hierarchical fashion, found a significant relationship with Trait Anxiety and no significant relationships with the other variables, including Diversion and the other two measured (factor) orientations.

The results indicate that the experimental instructions or manipulations need to be strengthened in future studies of this type, especially for the Diversion orientation. Inferences made from further tests of Diversion as an experimental manipulation should be made with care lest Type II errors be made in regard to the model. Regarding the other experimental groups, there is some evidence of information processing needs consistent with the model, although some care must be exercised regarding the efficacy of these manipulations as well.

Cognitive Effects: H3, H4

In regard to use of Imagery as a processing strategy, the null for H3 is not rejected across groups ($F_{3,110}$=.30, p=.83) or for the individual, pairwise comparisons. The Diversion instructions did not lead to greater use of Imagery strategy as hypothesized, nor Surveillance to less as compared to the Control Group. However, multiple regression (Table 4) indicates a positive relationship between the measured Diversion factor and a favorable attitude toward the author's use of Verbal Imagery (measured by a scale in the instrument). Interest in the article, and the use of Imagery processing strategy, also relate positively to favorability toward Verbal Imagery, although when a similar analysis is done with Imagery processing as the dependent variable, only the attitudinal variable bears a significant relationship. None of the three measured orientations show relationships with the Imagery Processing variable.

Concerning H4, the null hypothesis is not rejected across groups ($F_{3,110}$=2.02, p<.12) or for individual, pairwise comparisons. Neither Diversion nor Anticipated

Table 4

Variables Leading to Favorability Toward Images
Used by Author for All Subjects

Results of Multiple Regression Analysis (Planned, Hierarchical)

(Missing-data observations deleted from analysis.)

Variables listed in order of entry into analysis.

Variable	Beta	$F_{1,83}$
Trait Anxiety.	-.02	.05
Worry about the experiment.	.01	.00
Number of days before the experiment that subjects signed consent form.	-.01	.00
Effect of the form on concern about the experiment.	.04	.16
Sex (Male=0, Female=1).	-.13	1.98
Prior knowledge about the passenger pigeon.	-.05	.01
Number of subjects in the group.	.01	.01
Reading Time.	-.14	1.45
Rehearsal Time.	.06	.31
Number of times article was read.	-.15	2.59
Expectation of a test on the reading material.	-.02	.03
Interest in article.	.30	7.62 (b)
State Anxiety.	.18	2.59
"Surveillance" (factor score).	.10	1.16
"Diversion" (factor score).	.21	5.21 (a)
"Anticipated Communication" (factor score).	-.04	.17
Imagery Processing	.24	5.59 (a)
Perception that reading material counteracted reading goal.	-.11	1.12
Meeting of reading goal.	-.13	.96
Perception that reading material helped reading goal.	.11	.56

Constant: 3.82
Multiple-r=.62.

a. $p<.05$.
b. $p<.01$.

Analysis of Variance	DF	SS	MS	F	p<
Regression	20	40.93	2.05	2.57	.01
Residual	83	66.06	.80		

Communication instructions led to higher levels of Differentiation than Surveillance or Control. Nor was the Surveillance Group lower than the Control Group, the opposite found instead (t_{110}= -2.30, $p<.05$). This relationship however was not repeated with the measured Surveillance factor, which shows virtually no relationship with Differentiation (Table 6) in a multiple regression analysis. The Diversion factor score is in the expected direction, but Anticipated Communication is not (neither significant, however).

Processing Relationships: H5, H6

The results of this analysis (Table 5) also indicate a positive and significant relationship between Imagery Processing and Differentiation, thus providing evidence to reject the null hypothesis for H5. In addition, there is a significant negative relationship (Table 6) between Imagery processing and subjects' thinking about matters other than the subject matter of the article while reading, thus supporting rejection of the null hypothesis for H6. These results together tend to support the assumption that use of Imagery as a strategy for processing textually-based information may subsume processing resources and provide a highly detailed memorial representation.

It is apparent that subjects who were worried about taking part in the experiment and those who found the reading material incompatible with their reading goals had their attention understandably diverted from the subject matter while reading. One can only speculate that students with higher Grade Point Averages may have been busy second-guessing the purpose of the experiment. That the Diversion factor did not lead to greater attentional focus on the subject matter is in particular disappointing (albeit the material contained problem-oriented as well as nature-descriptive material).

However, the surveillance factor shows an interesting negative relationship with thinking about other matters. It is possible that processing or seeking

Table 5

Variables Leading to Differentiation for All Subjects

Results of Multiple Regression Analysis (Planned, Hierarchical)

(Missing-data observations deleted from analysis)

Variables listed in order of entry into analysis.

Variable	Beta	$F_{1,82}$
Trait Anxiety.	-.06	.36
Worry about the experiment.	-.17	2.18
Number of days before the experiment that subject signed consent form.	-.10	1.07
Effect of form on concern about experiment.	-.17	2.45
Sex (Male=0, Female=1).	-.01	.00
Prior knowledge about passenger pigeon.	-.04	.13
Number of subjects in group.	-.10	.90
Reading Time.	.04	.10
Rehearsal Time.	.02	.04
Number of times article was read.	-.06	.30
Expectation of a test on the reading material.	.04	.12
Interest in the article.	.01	.00
State Anxiety.	.02	.03
"Surveillance" (factor score).	.03	.10
"Diversion" (factor score).	.19	3.26
"Anticipated Communication" (factor score).	-.18	2.86
"Liking" the author's images.	.17	2.17
Imagery Processing	.23	4.13 (a)
Perception that reading material counteracted reading goal.	-.03	.06
Meeting of reading goal.	.20	1.73
Perception that reading material helped reading goal.	-.27	2.83

Constant: 9.39
Multiple-r=.54.

a. $p<.05$.

Analysis of Variance

	df	SS	MS	F	p<
Regression	21	425.00	20.24	1.57	(ns)
Residual	82	1059.46	12.92		

Table 6

Variables Leading to Attention to Matters Other than Subject Matter of Article

Results of Multiple Regression Analysis (Planned, Hierarchical)

(Missing-data observations deleted from analysis)

Variables listed in order of entry into analysis.

Variable	Beta	$F_{1,79}$
Trait Anxiety.	.16	2.06
Worry about the experiment.	.24	4.69 (a)
Number of days before the experiment that subject signed consent form.	.00	.02
Effect of form on concern about experiment.	.00	.02
Sex (Male=0, Female=1).	.13	1.82
Grade Point Average.	.24	5.30 (a)
Prior knowledge about passenger pigeon.	.16	2.25
Number of subjects in the group.	-.19	2.99
Reading Time.	.05	.17
Rehearsal Time.	-.15	1.83
Expectation of a test on the reading material.	.03	.10
Interest in the article.	.01	.01
State Anxiety.	-.12	.93
Surveillance (factor score).	-.22	5.19 (a)
Anticipated Communication (factor score).	.08	.65
"Liking" the author's images.	.11	.96
Belief that reading material was too emotional.	-.02	.04
Diversion (factor score).	-.04	.14
Imagery processing.	-.33	9.09 (b)
Meeting of reading goal.	.27	3.27
Perception that reading material helped reading goal.	-.23	2.30
Perception that reading material hindered reading goal.	.38	11.71 (b)

Constant: .03
Multiple-r=.60

a. $p<.05$.
b. $p<.01$.

Analysis of Variance

	df	SS	MS	F	p<
Regression	22	11.53	.52	2.04	.05
Residual	79	20.32	.26		

relational information may be highly consumptive of attentional resources, and any elaborations or inferences drawn from the reading material to other contexts may serve automatically to identify those "other matters" as connected to the subject matter of the article by virtue of the semantic link having been forged. Validating this proposition goes beyond this study, of course. Similarly, validation of the effects of using this form of processing must await further studies involving a wider array of recall tests, including a test designed to measure recallability of information from a semantic context other than that of a stimulus message.

Discussion

Although the hypothesized relationships between experimental conditions and State Anxiety, Imagery usage, and Differentiation did not materialize in this study (important as they are for validation of manipulations as well as of the overall model), the problems might be considered more those of method than of theory at this stage of testing. The experimental manipulations of Surveillance and Anticipated Communication were only partially efficacious, and the inducement of Diversion quite questionable. As such, these manipulations did not really set up conditions under which the orientations as measured could truly flourish in characteristics. In addition, the development of measures of a number of variables, such as Imagery Processing, are still at an early stage, no doubt producing some compounding of error. Also, only a portion of the model was to be represented in this design, with measures of other forms of cognitive processing and recall environments absent.

Nonetheless, when conducting analyses not directly involving the experimental conditions as independent variables, some promising and supportive relationships were found among key variables, suggesting that further research is warranted. Imagery Processing related positively to Differentiation and negatively to attention to other matters, as expected, giving some support to the assumption that Imagery

Strategy is resource and detail intensive. (It, of course, may not be the only processing strategy with these characteristics.) Favorability toward Verbal Imagery in text regresses positively on Diversion orientation (as measured), Imagery Processing, and interest in the article, although measured Diversion and interest do not seem to lead directly to Imagery Processing. Sorting out these relationships, and ferreting out other influential variables, may be an appropriate task for a technique such as path analysis.

Employing the experimental conditions as independent variables found differences in content expectations of the stimulus message in line with the model at least for Surveillance and Anticipated Communication orientations. Given that subjects in each experimental condition were told before reading that others had found the message useful for achieving these specific reading goals, these differences suggest the possibility of learned patterns of expectations of informational structure related to achieving different reading goals.

In addition, there is some evidence that Surveillance orientation includes some cognitive organizational tasks of a relational nature more complex than just "keeping up with events," although the aversion to detail proposed for this orientation and apparent in self-report measures was not validated via reduction in Imagery usage or Differentiation in this study. Similarly, the seeking of details proposed to be part of the Anticipated Communication orientation, and apparent in self-reports, did not materialize as higher Differentiation.

CONCLUSION

Blumler (1977) has suggested that research in Uses and Gratifications should pursue validation of the sources and antecedents of different uses of the media, as well as their effects. Thus study suggests that validation of effects can truly occur only within a total conceptual framework that includes validation of

the conditions leading to usage. "The best procedures for [experimental] manipulation" in Uses and Gratifications, McLeod and Becker (1981) observe, "no doubt require a sophisticated understanding of the antecedents governing motives."

Likely a major factor in the inefficacy of the Diversion manipulation in this experiment was that it attempted to work via suggestion instead of actually putting subjects into the kind of situation in which the proposed necessary conditions of Diversion as defined for this study--a need to keep some real anxiety out of mind to attain a more relaxed state for some real purpose--could be realized. In addition, Diversion subjects, and those in the other conditions, had no choice of stimulus material. At the very least, the assumption that message compatibility with Diversion requires in part description pleasurable to the individual may often have been violated in practice in this study. Providing such a choice may be particularly necessary for experimentation involving Diversion. Along with situational manipulations for Diversion (which potentially could present some ethical concerns), one possible approach to inducing a more relaxed state might include use of biological monitoring or "biofeedback" techniques. Studies of Diversion could also be designed to take advantage of higher levels of stress or anxiety occurring naturally among students during exam time.

Experimental induction of Anticipated Communication has the advantage of putting subjects into a more real situation antecedent to reading goals and motives. Differences in cognitive processing and recall may depend on the anticipation of different roles, which was not systematic in this study. Orientations such as "guidance-seeking" or "problem solving" might similarly be amenable to this kind of situational manipulation in laboratories.

Surveillance in particular presents at least three challenges to experimental manipulation. The first is a refined theoretical understanding of the underpinnings of this orientation such that it is better understood what the desired goal state

is, and when it has been reached (or the need fulfilled). McGuire (1974), of course, presents eight "cognitive" motivations (i.e., "forces that orient" or motives that "stress the person's information processing and attainment of ideational states"), many of which, separately or in combination, could represent Surveillance or some subsets of that orientation (e.g., attribution, autonomy, categorization, teleological motivations). Surveillance may also include ambiguity reduction to achieve a "definition of the situation" (Ball-Rokeach, 1973; McLeod and Chaffee, 1972), an approach that would seem amenable to study in regard to subjects reaching a perceived state of certainty.

The second challenge, especially relevant to Surveillance, amounts to subject-controlled reduction of external validity due to constrained use of their own LTM structures ("existing knowledge") in experimental settings. Subjects may well tend to keep the experimental stimulus material at a cognitive arm's-length, avoiding more extensive integrative recoding operations that combine with pre-existing cognitive structures. In regard to discourse as an experimental stimulus, Spiro (1977) observes:

> In general, the subject can be expected to assume that the information in the discourse is of no future usefulness... Even if (the discourses) are perceived as true, their truth and any other considerations regarding the topical content vis-a-vis prior knowledge are irrelevant to the purposes of the experiment...One of the main reasons in everyday life for relating new information to old is negated: selectively processing information in order to update one's knowledge (that is, keeping the knowledge "current") of issues which are personally interesting or important. It would be foolish to update one's knowledge with useless, isolated, and probably false information usually found in experimental prose. Furthermore, the normal basis for determining importance (for example, personal interests) are inoperative in the experimental situation....Knowledge about the communicator which might effect inferences about intentions and communicative function are also orthogonal to the topical content of the prose.

Thus, there may be a limitation to the extent of organisational recoding engaged in by Surveillance subjects (even when told to use the message to keep

in touch with the world's events) in an experimental setting. In addition, the impact of "trust in the author" on the success of the manipulation suggests that information about the author and his or her motivations may be an essential component (or perhaps, variable) in studies of this type.

Thirdly, in the absence of being given a definite expectations of what will follow the reading of an experimental message, subjects are likely to anticipate a test of some sort on the content of what they are reading. Surveillance and Control subjects were (about equally) more likely than, in order, Diversion and Anticipated Communication subjects to expect a post-reading test in this experiment ($F_{3,110}=6.56$, $p<.0005$), levels of expectation that seem to reflect a complement to alternative post-reading expectations likely induced by experimental instructions. Since a test represents a kind of recall environment, the anticipation of it has the potential of influencing processing behavior. While measurement or appropriate sleight-of-hand might control effects of test expectation, theoretical developments might suggest appropriate post-reading "expectations" for subjects in experimental conditions such as Surveillance.

The analysis of the "success" of the experimental instructions indicates some tentative guidelines likely applicable to a number of experiments. Specifically, more successful inducement seems likely to occur with underclassmen (in a college environment) and when subjects, if required to give approval on an Informed Consent Form, sign the form soon before participating in the experiment. Also, it is valuable for experimenters to become proficient in the protocol or administration of the experiment before running subjects that "count" (i.e., run a thorough, full-dress-rehearsal pretest soon before).

Along with development of theory, further research on this model might include signalled stopping technique to tap cognitive processes more immediately, perhaps even applying stopping to audio- or videotapes so processing-time components can be measured. Field surveys might refine theoretical understanding of Surveillance (in particular) and perhaps apply cognitive task dimensions.

Although the methodological parsimony and cross-condition adaptability of suggestion combined with environmental reinforcement made it attractive for this preliminary attempt to induce a set of different Uses and Gratifications orientations in a controlled setting, it did not prove to be an efficacious and trustworthy approach. Further experimentation will likely pursue stronger situational manipulations.

NOTES

1. Critiques and defenses of Imagery in memory can be found in Pylyshyn (1973) and Crowder (1976).

2. Repeated exposure can strengthen the memory trace for a specific item of information (Horton, 1968) or can produce separate, multiplexed memory traces, due to variability across repeatedly different storage (encoding) contexts for the same information, enhancing the likelihood of recall for the information (Flexser and Bower, 1974; Crowder, 1976). Similarly the amount of time devoted to processing a given message could allow repetition (especially in re-reading printed messages), strengthening the memory trace. Longer exposure could also allow reiteration and elaboration (further analysis of the information and its relationship with other information, including that in LTM), effectively increasing memory for the information (Craik and Lockhart, 1972).

3. Various media characteristics, such as print's capability to allow self-paced processing and television's potential to serve as an external presenter and storage for visual images, can be researched in an information-processing paradigm. Singer (1980), for example, suggests that research should examine the different roles of television and reading in the intellectual development of children, since television viewing might substitute for the active practice of imagery-related skills considered essential to a number of interpersonal and intellectual situations. Additionally, media such as television which do not allow the audience member to control presentational pacing may tend to inhibit the recoding processes essential for long-term storage since viewers can often be faced with having to "choose" between processing one item of information in depth or paying attention to the one that follows. Thus television, Singer (1980) notes, may be "an extremely inefficient medium for communicating any kind of complex information." Further research, however, may be able to separate the effects of the medium from those of the kinds of content typically associated with the medium (see Lometti, Reeves, and Bybee, 1977) such that certain pacing or structures of television messages may be found to facilitate elaboration by viewers or have other cognitive or affective effects (see Tower et al., 1979; Watt and Krull, 1977).

4. Going beyond "readability" (e.g., Klare, 1963), the structural characteristics of messages can be researched relative to their compatibility with information processing needs under various circumstances. Based on a model of information presentation formats developed by Chaffee and McLeod (1973a), Bybee (1980) for example found that information processing related to decision-making about a political matter was facilitated by an alternative-by-alternative message format that resulted in better recall, a faster decision, and less reported cognitive stress in the process (also see Frase, 1969).

   Other developments of message research within an information-processing approach might relate the "chunking" process of information reduction (Miller, 1956; Simon, 1974) to message structures (see Jacoby, 1976), study the propositional structures of prose as related to processing--including inferencing--and recall (Kintsch, 1974,1977; Kintsch et al., 1975; Fredericksen, 1972), further investigate the influence of "verbal imagery" in text (Anderson and Kulhavy, 1972; Heckler, 1975; Kintsch, 1974; Levin, 1973; Levin and Divine-Hawkins, 1974; Paivio, 1969,1971), or examine information processing differences between children and adults relative to message characteristics (see Calder et al., 1976), preferably under systematically varied task constraints.

5. Such strategies might be constrained by, or interact with, "cognitive styles." Kagan et al. (1963) for example found three cognitive styles subjects used to judge pictures. When asked to point out similarities, some subjects ("descriptive") attended to details, some ("inferential") put together classification schemes, and others ("relational") suggested functional relationships among objects in the pictures. Individual differences in Imagery usage (DiVesta et al., 1971) and other strategies are presumed to be distributed randomly across conditions in this experiment.

6. In Zajonc's experiments, the sender-versus-receiver instructions were given right after subjects read the message (which meant some re-processing of information after reading), but the expectation of being paired for communication with one who agrees or disagrees was induced prior to reading the message in the study which dealt with that variable. A later attempt to replicate Zajonc's finding was unsuccessful, perhaps due to circumstances that the subjects were journalism students and potentially sender-tuned due to their career expectations and educational background (Donnelly, 1968).

7. According to a recently reported pilot experiment (McLeod and Becker, 1981), subjects expecting to write an essay on international affairs wrote longer essays and included more distinct pieces of information in their essays than control subjects and subjects expecting a test on the subject. Knowledge test scores did not differ significantly, however.

8. In a pilot study, the author found tentative evidence that Anticipated Communication and Diversion subjects had higher Differentiation (an open-ended recall measure) than Surveillance subjects. Since this particular measure may have been sensitive to Imagery processing as a strategy to recall information from a descriptive passage, the result further provoked the suggestion that Imagery may be a processing strategy more facilitating to Diversion and Anticipated Communication goals than those of Surveillance.

9. Further study will develop this measure in relation to established Imagery tests (Betts, 1909; Sheehan, 1967; Gordon, 1949) which themselves were not appropriate for this study.

10. Although Journalism students would have been more accessible, Donnelly's suggestion (see Footnote 6) provided the impetus to sample from the student listing for the entire university, across disciplines, to aid the external validity which is always threatened in laboratory experiments. Students in the sample were contacted by phone and asked to take part in a study of reading, which would take about an hour, and for which they would be paid $3.50. They were sent reminder postcards and informed consent forms prior to their appointments, and were also phoned the evening before. A special informed consent form was devised, and approved by the university, for this study, since the standard form contains some warnings not applicable to this study, but which could have caused subjects anxiety, a variable that could have affected the outcome.

11. A professionally lettered sign, "Reading Study, Room 1," was on the door of the experiment room. On their way to that room, all subjects were led past another room with a similar sign, "Reading Study, Room 2," on the door, and their attention casually drawn to it. For Anticipated Communication subjects, that room, they were told later in the experiment, was occupied by their discussion partners. Subjects in other conditions heard no further reference to the room. After the last subject had arrived and walked past the bogus room, all subjects were kept waiting about five minutes on a set of chairs outside the experiment room but around the corner and out of sight of the bogus room. Anticipated Communication subjects were told that the wait was for the other persons taking part in the study, who supposedly had gone to the other room.

12. Aldo Leopold's (1949) "On a Monument to the Pigeon," an interpretive and descriptive piece concerning the extinction of the passenger pigeon. Subjects in a pilot study and in a pretest had indicated that the passage contained components useful for the various orientations. Subjects in this experiment were asked in the posttest whether some other material would have been more compatible with their reading goals, and if so, what material would have been preferred (open-ended). More than half of the Control and Anticipated Communication subjects, and about a third of the Surveillance and Diversion subjects, indicated no preference for other material. Anticipated Communication subjects otherwise tended to prefer material that contained more facts, as did a moderate but lesser proportion of subjects in the other groups. There is some evidence (tentative because of small cell sizes) that, compared to the other groups, more Surveillance subjects would have preferred material that was more interpretive, and more Diversion subjects would have favored material that dealt more exclusively with the passenger pigeon and not other matters. ($X^2_{18} = 30.9$, $p < .03$; intercoder reliability for open-ended measure: $r = .69$, proportion of agreement = 80%). This result should be considered as an indicator of direction for further development of the measures and procedures rather than as a substantive finding. Subjects were also asked via scales the extent to which they felt the message helped or hindered their reading goals, as well as how interested they were in the passage. These variables were entered into the multiple regression analyses as independent variables. Further research needs to develop and validate measures of message characteristics that could interact with information processing strategies and message attentional goals.

13. Small switches on a table next to each chair were connected to three indicator lamps outside the door of the experiment room. Wires were left visible enough so that subjects were assured that they connected to the lamps, not, perhaps, to some device that would cause a shock. Each subject was told to turn on the switch when he or she had completed reading, and that the experimenter would return to the room when all had finished. Using a stopwatch he had started quietly in his pocket when the subjects began reading, the experimenter recorded the elapsed time for each subject. Potential post-reading rehearsal time was calculated by subtracting a subject's reading time from the reading time of the last subject in the group to finish. The time it took for the experimenter to re-enter the room and begin the next set of instructions was about half a minute and constant. Subjects were given up to five minutes to read the passage.

14. Work areas to be used for completing the post-test were camouflaged during the reading so as not to reinforce the idea that a test was to follow.

15. The passage of time can also decrease accuracy of self report of cognitive processes, which are best reported on immediately after they occur. While reports of higher-level cognitive processes are limited in accuracy, they grow more prone to subjective, a priori causal theories as time intervenes between the process and the report (Nisbett and Wilson, 1977).

16. In all, 16 factors had emerged from an unbounded factor analysis, with Surveillance orientation the first factor (Eigenvalue of 13.3), accounting for 32 percent of the variance of that solution, Diversion orientation the second factor (Eigenvalue of 6.8), accounting for 16 percent of the variance, and Anticipated Communication orientation the third factor (Eigenvalue of 5.2), accounting for 12 percent of the variance. Together they accounted for 60 percent of the total. The other factors were either minor or uninterpretable. None represented systematic shifts in orientation from Time (1) to Time (2). The fourth factor accounted for only 6 percent of the variance, with an Eigenvalue of 2.3.

17. Efficacy refers to the ability of the instructions to induce the Uses and Gratifications conditions.

18. "Adoption" for purposes of this analysis consisted of a score greater than zero on the factor and greater than the other two factor scores for the subject. The relative rates of success for the various instructions were moderate for Anticipated Communication subjects (47%, as compared to 21% of Control subjects adopting that orientation primarily--$Z=2.11$, $p < .05$) and for Surveillance subjects (52%, as compared to 29% of Control subjects--$Z=1.83$, $p < .05$) but not significant for Diversion subjects (33%, as compared to 21% of Control subjects--$Z=1.02$, ns). Among Control subjects, 29% did not adopt any of the measured orientations.

Appendix A

Factor Loadings for Measured Orientations

Surveillance: Primary Set	Factor 1 Surveillance	Factor 2 Anticipated Communication	Factor 3 Diversion
Finding out what is important in the world around me. (2)	.74	.17	.19
Understanding the significance of what is going on in the world around me. (1)	.71	.02	.10
Adjustment of my concepts of the world around me. (2)	.71	.10	.14
Awareness of what the important problems are in the world around me. (2)	.71	.21	.01
Being in-touch with the world around me. (2)	.70	.17	.19
A sense of participation in the events of the world around me. (1)	.68	.15	.00
Understanding of the significance of what is going on in the world around me. (2)	.67	.15	.01
Awareness of the values in the world around me. (2)	.67	.10	.16
Assistance in organizing world happenings in my mind. (2)	.66	.11	.08
A sense of participation in the events of the world around me. (2)	.65	.24	.09

Surveillance: Primary Set	Factor 1 Surveillance	Factor 2 Anticipated Communication	Factor 3 Diversion
Awareness of the values in the world around me. (1)	.62	-.05	.17
Finding out what is important in the world around me. (1)	.62	.05	.14
Assistance in organizing world happenings in my mind. (1)	.62	.05	.10
Adjustment of my concepts of the world around me. (1)	.61	-.14	.05
Awareness of what the important problems are in the world around me. (1)	.61	-.07	-.09
Being in-touch with the world around me. (1)	.60	.02	.02
Keeping up with events. (1)	.58	.32	-.21
A feeling of being a part of things greater than myself. (2)	.55	.05	.30
A feeling of being a part of things greater than myself. (1)	.48	-.04	.33
Surveillance: Secondary Set			
Contact with ideas I may not learn from friends and family. (2)	.45	.44	.13
Contact with ideas I may not learn from friends and family. (1)	.43	.37	.11

Surveillance: Secondary Set	Factor 1 Surveillance	Factor 2 Anticipated Communication	Factor 3 Diversion
Help to figure out why people do the things they do. (2)	.41	.29	.17
Help for solving a problem. (2)	.36	.33	.13
Stimulation. (1)	.35	.07	.27
A way to relate this matter to other matters. (1)	.31	.30	.18
A way to relate this matter to other matters. (2)	.03	.03	.01
Anticipated Communication: Primary Set			
Information that I could use in a discussion. (2)	-.08	.73	-.10
Something to talk about with others. (2)	-.02	.70	.02
Being "well informed" in the eyes of others. (2)	.12	.70	.11
"Ammunition" to use in arguments with others. (2)	-.02	.68	.14
Something to tell others about this matter. (2)	.11	.66	.07
Preparation for learning more about this matter later from other people. (2)	.06	.60	.03
Something to talk about with others. (1)	.05	.58	-.21

Anticipated Communication: Primary Set	Factor 1 Surveillance	Factor 2 Anticipated Communication	Factor 3 Diversion
Something to tell others about this matter. (1)	.06	.57	-.06
Information that I could use in a discussion. (1)	.04	.56	-.14
"Ammunition" to use in arguments with others. (1)	.00	.56	.10
Finding out what others think about this matter. (2)	.23	.54	.01
Being "well informed" in the eyes of others. (1)	.14	.54	.12
Comparison of my judgment of this matter to another's. (2)	.13	.52	.15
Preparation for learning more about this matter later from other people. (1)	.03	.51	-.03
Comparison of my judgment of this matter to another's. (1)	.24	.46	.07
A way to learn about the subject matter without other people criticizing my level of knowledge. (1)	.13	.46	.35
Anticipated Communication: Secondary Set			
A way to learn about the subject matter without other people criticizing my level of knowledge. (2)	.06	.43	.33
Keeping up with events. (2)	.39	.43	.04

Anticipated Communication: Secondary Set	Factor 1 Surveillance	Factor 2 Anticipated Communication	Factor 3 Diversion
Details about the subject matter of this article. (2)	-.15	.39	-.12
A clearer picture of the issue. (1)	.27	.38	-.35
Details about the subject matter of this article. (1)	-.07	.34	-.33
Help for solving a problem. (1)	.16	.29	.22
A clearer picture of the issue. (2)	.15	.27	-.20
Help to figure out why people do the things they do. (1)	.15	.27	.10
Finding out what others thing about this matter. (1)	.26	.27	-.17
Diversion: Primary Set			
Forgetting my cares, worries, and problems. (2)	.10	.13	.75
Forgetting my cares, worries, and problems. (1)	-.05	-.05	.74
A retreat from anxiety. (2)	.06	.05	.74
Relaxation. (2)	.15	.11	.72
A retreat from anxiety. (1)	.04	.01	.71
Greater calmness in myself. (1)	.01	-.21	.68
Relaxation. (1)	.01	-.01	.65

Diversion: Primary Set	Factor 1 Surveillance	Factor 2 Anticipated Communication	Factor 3 Diversion
Overcoming of boredom. (2)	.14	.22	.65
Greater calmness in myself. (2)	.31	-.14	.61
Overcoming of boredom. (1)	.21	.12	.55
Diversion: Secondary Set			
Help to alleviate the effect of my fears. (2)	.16	-.01	.45
Help to alleviate the effect of my fears. (1)	.08	.12	.45
Stimulation. (2)	.32	.11	.43

Factor	Eigenvalue	Pct. of Var.	Cum. Pct.
Surveillance	13.0	53.2	53.2
Anticipated Communication	6.5	26.6	79.7
Diversion	5.0	20.3	100.0

Appendix B

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